

AMENDMENTS TO THE CLAIMS

Please cancel claims 1-2; amend claims 3-4; and add new claims 5-23 as follows. All claims are reproduced below.

1.– 2. (Cancelled).

3. (Currently Amended) A method for determining a domain of definition (DOD) in a warped image, the warped image formed from an original image, each pixel of the warped image having a displacement from a corresponding pixel in the original image, the original image unrestricted by a border, the method comprising:

determining an original DOD associated with the original image, the original DOD comprising a region of the original image with a boundary surrounding useful information, the boundary having a plurality of edges corresponding to a plurality of directions;

for each pixel located ~~along~~ on the plurality of edges of the original DOD;[[.]]

determining a location of a corresponding pixel in the warped image; and

determining a displacement of the pixel in the warped image from its
corresponding pixel in the original image;

for each of the [[a]] plurality of edges ~~directions~~, determining a maximal displacement value of a pixel [[in]] on the edge in the [[that]] direction, corresponding to the edge; and

determining a new DOD for the warped image, the new DOD for the warped image corresponding to a DOD in the original image, and each edge of the new DOD displaced in ~~each of the plurality of directions~~ the direction and by the determined maximal displacement value corresponding to the edge of the original DOD.

4. (Currently Amended) The method of claim 3 wherein the plurality of directions includes up, down, left and right.

5. (New) The method of claim 3, further comprising:
displaying a first portion of the new DOD within a first region of interest, the first region of interest comprising a viewable window of the warped image.
6. (New) The method of claim 5, further comprising:
displaying a second portion of the new DOD within a second region of interest, the second portion of the new DOD residing outside of the first region of interest.
7. (New) The method of claim 3, wherein the original DOD and the new DOD are rectangular.
8. (New) The method of claim 3, wherein determining the new DOD further comprises determining a forward warp using a low-resolution proxy image of the original image.
9. (New) The method of claim 3, wherein the warping operation comprises a morphing operation.
10. (New) A method for determining a domain of definition (DOD) formed as a result of a warping operation of an original image, the method comprising:
determining an original DOD associated with the original image, the original DOD comprising a region of the original image with a boundary surrounding useful information prior to the warping operation, the warping operation constrained by pixels being fixed at image borders;
determining a maximum displacement in each of a plurality of directions based on constraints for pixel repositioning in the warping operation, the plurality of directions corresponding to a plurality of edges of the original DOD; and
determining a new DOD by displacing each edge of the original DOD boundary by the determined maximum displacement in the direction corresponding to each edge.

11. (New) The method of claim 10 wherein the plurality of directions includes up, down, left and right.

12. (New) The method of claim 10, further comprising:
displaying a first portion of the new DOD within a first region of interest, the first region of interest comprising a viewable window of the warped image.

13. (New) The method of claim 12, further comprising:
displaying a second portion of the new DOD within a second region of interest, the second portion of the new DOD residing outside of the first region of interest.

14. (New) The method of claim 10, wherein the original DOD and the new DOD are rectangular.

15. (New) The method of claim 10, wherein determining the new DOD further comprises determining a forward warp using a low-resolution proxy image of the original image.

16. (New) The method of claim 10, wherein the warping operation comprises a morphing operation.

17. (New) A warping engine for determining a domain of definition (DOD) in a warped image, the warped image formed from an original image, each pixel of the warped image having a displacement from a corresponding pixel in the original image, the original image unrestricted by a border, the warping engine comprising:

a warping module adapted to warp the original image; and

a DOD module operatively coupled to the warping module, the DOD module

adapted to:

determine an original DOD associated with the original image, the original

DOD comprising a region of the original image with a boundary surrounding useful information, the boundary having a plurality of edges corresponding to a plurality of directions;
for each pixel located on the plurality of edges of the original DOD:
determine a location of a corresponding pixel in the warped image;
and
determine a displacement of the pixel in the warped image from its corresponding pixel in the original image;
for each of the plurality of edges, determine a maximal displacement value of a pixel on the edge in the direction corresponding to the edge; and
determine a new DOD for the warped image, the new DOD for the warped image corresponding to a DOD in the original image, each edge of the new DOD displaced in the direction and by the determined maximal displacement value corresponding to the edge.

18. (New) The system of claim 17 wherein the plurality of directions includes up, down, left and right.

19. (New) The system of claim 17, wherein the warping engine is further adapted to:

calculate a first portion of the new DOD within a first region of interest, the first region of interest comprising a viewable window of the warped image;
and
calculate a second portion of the new DOD within a second region of interest, the second portion of the new DOD residing outside of the first region of interest.

20. (New) A warping engine for determining a domain of definition (DOD) formed as a result of a warping operation of an original image, the warping engine comprising:
a warping module adapted to warp the original image; and

a DOD module operatively coupled to the warping module, the DOD module adapted to:

- determine an original DOD associated with the original image, the original DOD comprising a region of the original image with a boundary surrounding useful information prior to the warping operation, the warping operation constrained by pixels being fixed at image borders;
- determine a maximum displacement in each of a plurality of directions based on constraints for pixel repositioning in the warping operation, the plurality of directions corresponding to a plurality of edges of the original DOD; and
- determine a new DOD by displacing each edge of the original DOD boundary by the determined maximum displacement in the direction corresponding to each edge.

21. (New) The system of claim 20 wherein the plurality of directions includes up, down, left and right.

22. (New) The system of claim 20, wherein the warping engine is further adapted to:

- calculate a first portion of the new DOD within a first region of interest, the first region of interest comprising a viewable window of the warped image; and
- calculate a second portion of the new DOD within a second region of interest, the second portion of the new DOD residing outside of the first region of interest.

23. (New) A computer program product for determining a domain of definition (DOD) in a warped image, the warped image formed from an original image, each pixel of

the warped image having a displacement from a corresponding pixel in the original image,
the original image unrestricted by a border, the computer program product comprising:

a computer-readable medium; and

computer program code, stored on the medium, for:

determining an original DOD associated with the original image, the original

DOD comprising a region of the original image with a boundary
surrounding useful information, the boundary having a plurality of
edges corresponding to a plurality of directions;

for each pixel located on the plurality of edges of the original DOD:

determining a location of a corresponding pixel in the warped image;

and

determining a displacement of the pixel in the warped image from its
corresponding pixel in the original image;

for each of the plurality of edges, determining a maximal displacement value

of a pixel on the edge in the direction corresponding to the edge; and

determining a new DOD for the warped image, the new DOD for the warped
image corresponding to a DOD in the original image, each edge of
the new DOD displaced in the direction and by the determined
maximal displacement value corresponding to the edge of the
original DOD.